

# Mineral Industry Surveys

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## VANADIUM IN AUGUST 2005

Reported domestic consumption of vanadium in August 2005 was about 3% less than that of the previous month and was about 5% less than that of August 2004, according to the U.S. Geological Survey. Consumer stocks of vanadium, in all forms, were 398 metric tons (t) at the beginning of 2005 and 270 t at the end of August.

According to Ryan's Notes (2005), U.S. ferrovanadium (FeV) prices ranged from \$22.889 to \$24.556 per pound of vanadium content in August, as compared with \$33.722 to \$35.833 in July. European FeV prices ranged from \$37.889 to \$41.111 per kilogram (kg) in August, as compared with \$65.556 to \$70.222 in July. Vanadium pentoxide ( $V_2O_5$ ) prices ranged from \$8.333 to \$10.167 per pound in August as compared with \$15.222 to \$17.556 in July.

Precious Metals Australia Ltd. (PMA) (West Perth, Western Australia) raised \$10.2 million to further its plans to reopen the Windimurra Mine in Western Australia. The funds were raised by placement of 19 million additional shares in the company by international investors. PMA also planned to seek a listing on the London Stock Exchange's Alternative Investment Market by the end of 2005. The new funds were for assessment of the feasibility of redeveloping Windimurra, for purchasing plant

equipment for redevelopment, and for working capital. PMA planned to add a ferrovanadium conversion facility at Windimurra and increase the project's annual capacity to the equivalent of 10,000 t (20 to 22 million pounds) of  $V_2O_5$  (Platts Metals Week, 2005).

Vanadium suppliers pinned their hopes on lower prices to ward off the threat of niobium substitution by stainless steel mills. Market participants stated that FeV needed to dip below \$40 per kilogram (about \$18 per pound) for buying to resume. Evidence of the pressure that the mills applied to vanadium producers was the decision by Arcelor's Ugine & ALZ (Luxembourg) to change its alloy surcharge formula. The European stainless steel maker included niobium in its charge, indicating its willingness to retreat from vanadium if necessary (Metal Bulletin, 2005).

## References Cited

- Metal Bulletin, 2005, Vanadium slide may discourage substitution: Metal Bulletin, no. 8905, August 8, p.14.  
Platts Metals Week, 2005, PMA eyes Windimurra restart: Platts Metals Week, v. 76, no. 33, August 15, p.6.  
Ryan's Notes, 2005, [untitled]: Ryan's Notes, v. 11, no. 31, August 1, p. 10.

TABLE 1  
U.S. CONSUMPTION AND CONSUMER STOCKS OF VANADIUM, BY FORM<sup>1</sup>  
(Kilograms, contained vanadium)

	2004 <sup>r</sup>		2005			
			July		August	
	Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	3,610,000	298,000	256,000	235,000 <sup>r</sup>	275,000	248,000
Vanadium-aluminum alloy	W	W	W	W	W	W
Other <sup>3</sup>	449,000	101,000	20,600	32,600	25,800	23,900
Total	4,050,000	398,000	276,000	267,000 <sup>r</sup>	301,000	272,000

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes other vanadium-iron-carbon alloys as well as vanadium oxides added directly to steel.

<sup>3</sup>Includes other vanadium alloys, vanadium metal, vanadium pentoxide, vanadates, chlorides, other specialty chemicals, and items indicated by symbol W.

TABLE 2  
U.S. CONSUMPTION OF VANADIUM, BY END USE<sup>1</sup>  
(Kilograms, contained vanadium)

	2004 <sup>r</sup>	2005		
		July	August	Year to date
Steel:				
Carbon	1,300,000	62,800	61,500	608,000
High-strength low-alloy	1,160,000	83,900	87,400	718,000
Stainless and heat-resisting	60,000	5,080 <sup>r</sup>	5,080	39,600
Full alloy	1,060,000	71,400	88,300	684,000
Tool	239,000	32,300	32,300	277,000
Total steel	3,820,000	255,000 <sup>r</sup>	275,000	2,330,000
Superalloys	16,600	780	752	6,520
Miscellaneous and unspecified <sup>2</sup>	215,000	20,100	25,300	160,000
Total consumption	4,050,000	276,000 <sup>r</sup>	301,000	2,490,000

<sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes cast irons, alloys excluding steel and superalloys, chemical and ceramic uses, and other miscellaneous and unspecified uses.

TABLE 3  
U.S. IMPORTS AND EXPORTS OF ALUMINUM-VANADIUM MASTER ALLOY AND  
VANADIUM METAL, INCLUDING WASTE AND SCRAP<sup>1</sup>

(Kilograms, gross weight)

	Aluminum-vanadium master alloy		Vanadium metal, including waste and scrap	
	Quantity	Value	Quantity	Value
Imports for consumption:				
2004	19,100	\$66,700	31,200	\$1,710,000
2005:				
May	--	--	1,390	201,000
June	--	--	11,500	507,000
July:				
Mexico	--	--	379	3,120
Total	--	--	379	3,120
Year to date	1	3,770	27,300	1,580,000
Exports:				
2004	10,900,000	24,000,000	522,000	7,760,000
2005:				
May	968,000	2,230,000	5,720	442,000
June	1,220,000	5,110,000	5,340	338,000
July:				
Australia	36,900	159,000	--	--
Brazil	4,720	22,000	--	--
Canada	46,200	160,000	107	2,900
China	12,500	122,000	--	--
Germany	--	--	26	37,600
Israel	--	--	8	2,850
Japan	21,100	101,000	33,400	2,720,000
Korea	1,130	4,000	--	--
Mexico	1,000,000	2,070,000	--	--
Thailand	37,500	177,000	--	--
United Kingdom	9,070	71,200	18,300	1,490,000
Total	1,170,000	2,890,000	51,800	4,250,000
Year to date	6,700,000	19,900,000	195,000	11,200,000

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS AND EXPORTS OF FERROVANADIUM, VANADIUM PENTOXIDE (ANHYDRIDE) AND  
OTHER OXIDES AND HYDROXIDES OF VANADIUM<sup>1</sup>

(Kilograms, contained vanadium)

	Ferrovanadium		Vanadium pentoxide (anhydride) <sup>2</sup>		Other oxides and hydroxides of vanadium	
	Quantity	Value	Quantity	Value	Quantity	Value
Imports for consumption:						
2004	3,020,000	\$62,100,000	1,040,000	\$8,600,000	120,000	\$1,650,000
2005:						
May	197,000	14,800,000	32,800	2,710,000	8,430	740,000
June	183,000	14,000,000	63,100	4,830,000	8,430	842,000
July:						
Austria	53	2,390	--	--	4,720	842,000
Australia	--	--	19,900	962,000	--	--
Canada	8,990	430,000	--	--	--	--
China	253	11,500	17,000	1,390,000	--	--
Czech Republic	97,000	9,880,000	--	--	--	--
Germany	134	16,400	--	--	--	--
Japan	186	8,430	--	--	--	--
Korea, Republic of	27,900	1,660,000	--	--	--	--
South Africa	--	--	59,900	3,670,000	15,800	107,000
Swaziland	31,300	1,240,000	--	--	--	--
United Kingdom	1,200	135,000	--	--	--	--
Total	167,000	13,400,000	96,800	6,020,000	20,500	949,000
Year to date <sup>3</sup>	11,200,000	90,700,000	606,000	26,700,000	67,900	3,800,000
Exports:						
2004	267,000	8,770,000	240,000	2,090,000	584,000	4,140,000
2005:						
May	147,000	4,240,000	77,500	1,210,000	92,200	2,450,000
June	7,120	138,000	24,000	661,000	77,800	4,210,000
July:						
Canada	371	7,480	--	--	15,300	149,000
China	43,500	2,380,000	--	--	--	--
Germany	--	--	477	15,900	--	--
Mexico	--	--	1,830	17,400	--	--
Venezuela	14,100	471,000	--	--	--	--
Total	58,000	2,860,000	2,310	33,300	15,300	149,000
Year to date	309,000	12,300,000	127,000	2,550,000	418,000	9,470,000

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include catalysts containing vanadium pentoxide.

<sup>3</sup>May include revisions to previous months data.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF VANADIUM-BEARING ASH, SLAG<sup>1</sup>

(Kilograms, contained vanadium pentoxide)

	Ash and residues		Ash and residues (not from the manufacture of iron and steel)		Slag, from the manufacture of iron and steel	
	Quantity	Value	Quantity	Value	Quantity	Value
2004	4,260,000	\$8,520,000	11,100,000	\$2,000,000	244,000,000	\$10,400,000
2005:						
May	60,000	120,000	907,000	103,000	47,200,000	948,000
June	800,000	1,920,000	600,000	101,000	86,100,000	1,760,000
July:						
Canada	--	--	767,000	119,000	114,000,000	1,380,000
Mexico	107,000	275,000	--	--	--	--
Total	107,000	275,000	767,000	119,000	114,000,000	1,380,000
Year to date	2,400,000	5,010,000	4,290,000	690,000	302,000,000	5,760,000

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF MISCELLANEOUS VANADIUM CHEMICALS<sup>1</sup>

(Kilograms, contained vanadium)

	Sulfates		Vanadates	
	Quantity	Value	Quantity	Value
2004	500	\$19,100	74,700	\$1,150,000
2005:				
May	--	--	12,900	389,000
June	--	--	6,360	166,000
July:				
Germany	--	--	6,360	166,000
Korea, Republic of	--	--	4,500	25,700
South Africa	--	--	6,230	359,000
Total	--	--	17,100	551,000
Year to date	--	--	54,700	1,520,000

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

Source: U.S. Census Bureau.